

*THE USE OF THE WIRE SAW FOR
QUARRYING.*

PROF. C. LE NEVE FOSTER has conferred a great benefit on the Welsh mining industry by directing attention to a new method of slate-mining recently tried in the Pyrenees. At Labassère the wire saw is employed to make horizontal cuts across the inclined beds of

as an appendix to Prof. Le Neve Foster's annual report to the Home Office for the year 1900. The investigation clearly shows that slate might be worked in many quarries in North Wales by the wire saw method with conspicuous advantages. There would be lessened blasting, fewer falls of ground, less waste of good rock, reduced cost of working, less cost of explosives, a saving in the cost of unproductive work, a saving in the cost of re-

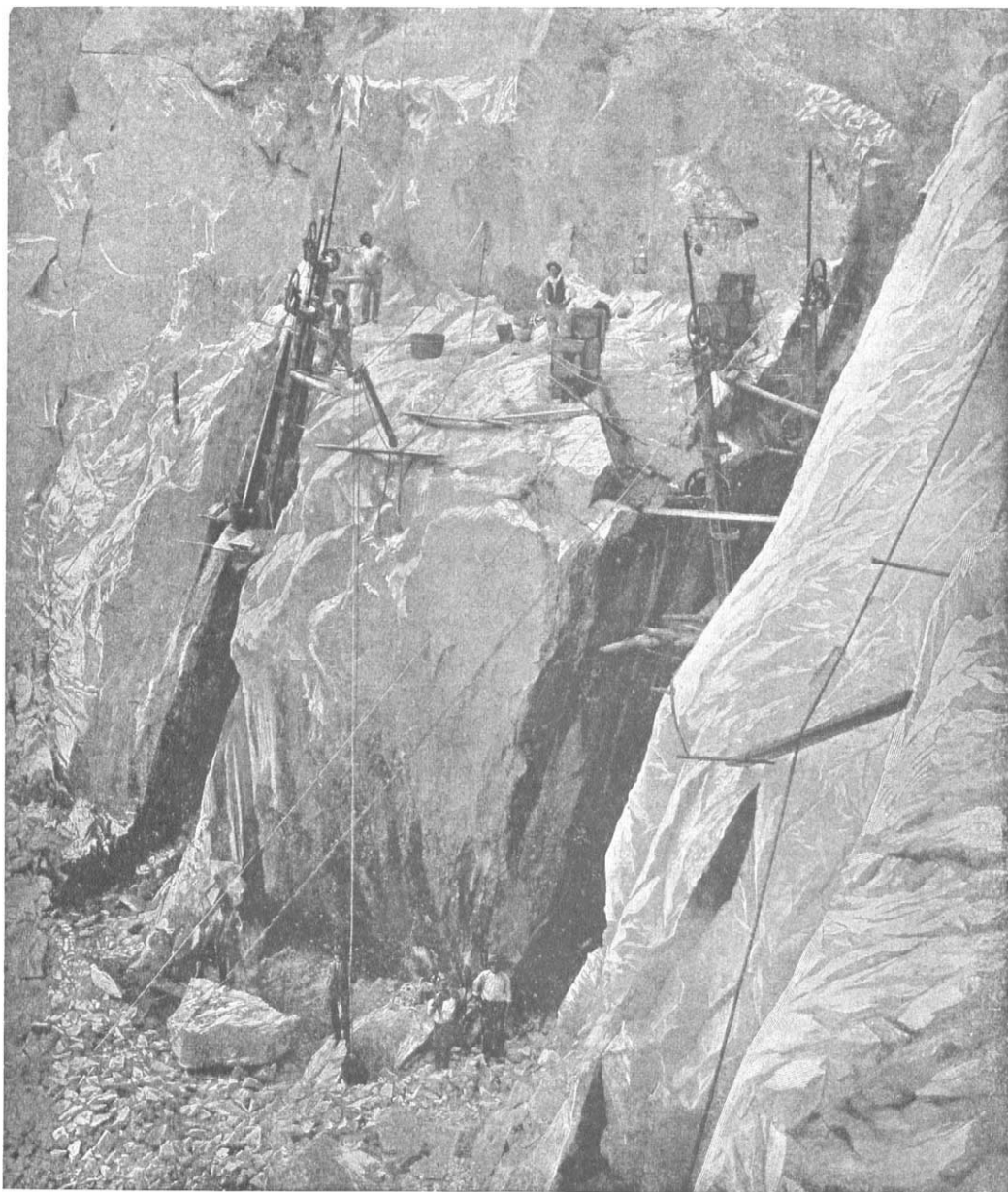


FIG. 1.—Use of the wire saw at Carrara.

slate, severing off great blocks without blasting. Believing that a similar system could be employed with advantage in North Wales, Prof. Le Neve Foster recommended that Mr. G. J. Williams, H.M. Assistant Inspector of Mines, should study the question on the spot. The Home Secretary having acceded to this suggestion, Mr. Williams has drawn up a very valuable report, which is published

moving rubbish, no need of quarrying worthless rock in underground workings, and the cost of examining and securing the roofs and pillars would be done away with.

The helicoidal wire saw has been employed for quarrying marble in Belgium and in Italy for some years. It is an endless cord, composed of three hard wires twisted together, which is made to travel along by machinery and

is fed continuously with sand and water, the sharp particles of sand gradually cutting a groove. As the groove is deepened the cord must necessarily be kept applied to the rock. This is effected by guiding-pulleys mounted in pits sunk at the ends of the proposed cut. These pulleys must be at least 20 inches in diameter, and the pits somewhat larger. For sinking these pits there are employed in some Belgian quarries a rotative borer composed of a steel tube cutting an annular groove. The wire saw was applied at Carrara for subdividing blocks of marble, but the impracticability of using the revolving cylinder or hand labour for sinking inclined pits was an obstacle to its further use. The difficulty was, however, overcome by Mr. A. Monticolo, who invented an ingenious appliance which he termed a penetrating pulley, with which it is possible to replace the somewhat costly pit by a bore-hole 3 inches in diameter. The penetrating pulley consists of a disc 20 inches in diameter and $\frac{1}{4}$ inch thick, with a semicircular groove round its periphery deep enough to take half the thickness of the wire, the other half projecting. The disc is mounted on a pivot and is supported by a hollow steel shaft of slightly smaller diameter than the bore-hole. To the shaft is attached a series of tubes of equal diameter forming a column that may be lengthened at will, in the interior of

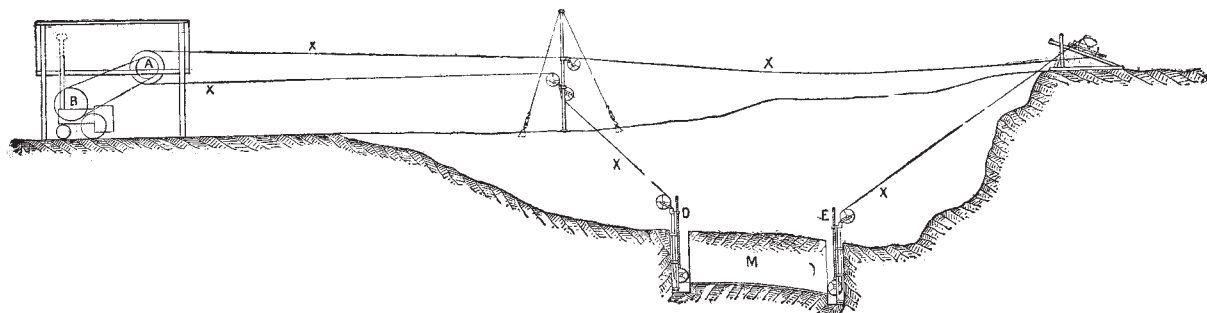


FIG. 2.—Installation of the helicoidal wire saw at a quarry. X, helicoidal wire; A, fixed pulley; B, motor; C, tightening arrangement; D, E, wire saw and grinding pulleys; M, block of marble being quarried.

which is a fine tube serving for the lubrication of the pivots. As the cut deepens the pulley is fed down automatically by means of an eccentric. For cutting a groove, two bore-holes, to receive the shafts carrying the axes of the pulleys, are first made by hand or by the diamond drill.

The pulley was first applied in March 1898 at the Campanile quarry, Carrara, where cuts have been made 50 feet long and 16 feet deep, inclined at an angle of five degrees from the horizontal. The highly satisfactory results obtained with the penetrating pulley serve to show that there is a great saving of expense by the substitution of bore-holes for pits, far less waste of valuable marble, and increased rapidity of quarrying and consequently increased output.

Almost simultaneously with the publication of Mr. Williams' report, the *Revue Générale des Sciences* published an exhaustive article by Mr. J. Boyer on the present condition of the French marble industry. This article is profusely illustrated and contains a large amount of information relating to the use of the wire saw. From this article the two illustrations accompanying this note have been borrowed.

NOTES.

DR. F. McCLEAN and Sir John Murray, whose names were included in the list of the new Council of the Royal Society given in NATURE of November 14, are unable to serve; and the two Fellows recommended for election in their places are the Right Hon. Sir John Gorst and Prof. H. H. Turner.

NO. 1674, VOL. 65]

SIR WILLIAM ROBERTS-AUSTEN, K.C.B., F.R.S., will deliver the tenth "James Forrest" lecture at the Institution of Civil Engineers on April 17, 1902, the subject being "Metallurgy in Relation to Engineering."

THE governing committee of the Allegheny Observatory has decided to erect a 30-in. reflector at that institution as a memorial to the late Prof. Keeler. As it is expected that the funds subscribed will exceed the estimated cost of the instrument (2000*l.*), the balance will be used either to found a general fellowship for the study of astrophysics, or the award of a Keeler medal for work in the same field.

THE Royal Society of Public Medicine of Belgium has awarded Prof. Corfield, of University College, London, its bronze medal in recognition of his devotion to public health work.

A SUCCESSFUL kinematograph of the Severn bore was exhibited by Dr. Vaughan Cornish at the meeting of the Royal Geographical Society on Monday. This is, we believe, the first time that the impressive movement of a tidal bore has been recorded by photography and the phenomenon reproduced before an audience by a series of moving pictures.

A NEW Highland meteorological station has been established at Achariach in Glen Nevis, $4\frac{1}{4}$ miles S.E. of the Low Level Observatory at Fort William, and $2\frac{1}{4}$ miles S.W. of the observatory on Ben Nevis. The station is about 150 feet above sea-level, and the observations in the valley will be especially interesting in connection with the study of descending currents of cold air from the glens in the vicinity.

THE Council of the Royal Meteorological Society has designated Dr. Alexander Buchan, F.R.S., as the first recipient of the Symons gold medal in recognition of the valuable work which he has done in connection with meteorological science. This medal, which is to be awarded biennially, was founded in memory of the late Mr. G. J. Symons, F.R.S., the distinguished meteorologist and originator of the British Rainfall Organisation. The medal will be presented at the annual meeting of the Society on January 15, 1902.

A REUTER telegram announces that the *Gauss*, with the German Antarctic Expedition on board, arrived at Cape Town on Saturday morning, after being six weeks overdue. After leaving Hamburg on August 11 the *Gauss* touched at Las Palmas, and St. Vincent Islands. Deep-sea soundings were taken towards the west, but the ship did not go so far as the American coast. The *Gauss* was under sail the whole time, and the scientific observations made are said to be most satisfactory. The vessel will remain at Cape Town for ten days, and will then proceed to Kerguelen Island.